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Docket No. 60,469-031  
OT-4791

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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Applicant: Gieras, et al  
Serial No.: 09/740,231  
Filed: 12/18/00  
Group Art Unit: 2834  
Examiner: Elkassabgi, Heba  
Title: **METHOD OF MAKING TRANSFER FLUX MOTORS**

**APPEAL BRIEF**

Box AF  
Commissioner for Patents  
P. O. Box 1450  
Alexandria, VA 22313-1450

Dear Sir:

The Notice of Appeal in this application was filed on September 15, 2003. Appellant now submits its brief in the above-referenced application. A Credit Card Payment Form in the amount of \$330.00 is enclosed. The Commissioner is authorized to charge Deposit Account No. 50-1482 in the name of Carlson, Gaskey & Olds for any additional fees or credit the account for any overpayment.

**Real Party in Interest**

Otis Elevator Company is the real party in interest.

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**Related Appeals and Interferences**

There are no related appeals or interferences.

### **Status of the Claims**

Claims 22 and 23 are allowed. The Examiner has admitted that claims 13 and 17-20 contain allowable subject matter. None of those claims are on appeal.

Applicant appeals the outstanding rejection of claims 10-12, 14-16 and 21. Claims 10 and 16 stand rejected under 35 U.S.C. §102. The remaining rejected claims are rejected under 35 U.S.C. §103 based upon different combinations as described below.

### **Status of Amendments**

An amendment after final was entered resulting in the claims as they appear in the Appendix.

### **Summary of the Invention**

Transverse flux motors are useful for driving arrangements such as elevator or escalator systems because such motors are capable of producing high torque densities and allow for avoiding traditional geared arrangements within a driving system. Transverse flux motors present significant challenges, however, because the armature has a complicated structure. Conventional processes for making the flux motor components are prohibitively expensive for many applications.

This invention provides a transverse flux motor arrangement that is unique and provides manufacturing economies that render the motor assembly usable within systems where cost constraints are an issue, for example. Referring to Figures 1-4, an example electric motor designed according to an embodiment of this invention includes a stator 22 having stator core portions 28 and a coil 26 nestingly supported between the core portions. In the illustrated example, the core portions include projections 32 extending from ring portions in a radial direction. In the illustrated

example, an inward axial surface on each projection 32 is received against an outside axial surface of the coil 26, which partially covers the outside axial surfaces. This can be appreciated from Figure 3, for example. (Page 4, lines 7-16).

A rotor 24 is supported for relative rotary movement to the stator 22. (Page 4, lines 5-6).

In the illustrated example, outer support members 40 are received about the outer axial surfaces of the core portions 28. In the illustrated arrangement, the support members 40 include a plurality of receiver portions 44 that receive magnetic core members 46 (as can be appreciated from Figures 5 and 6). (Page 5, lines 4-6).

Claim 10 recites, in part, a stator having first and second stator core portions and a coil nestingly supported between the core portions such that at least part of axial surfaces on the coil are covered by the core portions. The dependent claims on appeal add various structural limitations.

### **Issues**

Whether the rejection under 35 U.S.C. §102, which is based upon an improper reading of the *Lange* reference, is proper.

Whether the rejections under 35 U.S.C. §103 are proper when there is no motivation for making the proposed modifications because they provide no benefit and the proposed combinations do not result in the claimed invention.

### **Grouping of Claims**

The rejection of claims 10-12, 14-16 and 21 are contested.

Claims 10 and 16, which are both rejected under 35 U.S.C. §102, stand or fall together for purposes of this appeal.

Claims 14 and 21 stand or fall together for purposes of this appeal, but are separately patentable from the other claims.

Claims 11 and 12 stand or fall together for purposes of this appeal, but are separately patentable from the other claims.

Claim 15 stands alone.

## **Argument**

### **INTRODUCTION**

The *Lange* reference, which is the basis of the Examiner's rejections, cannot be read on any of Applicant's claims even if there were motivation to combine it with the other cited references. The Examiner's interpretation of that reference is directly contrary to the teachings of that reference. Moreover, even if one could construe the elements pointed to by the Examiner in the manner that the Examiner contends, the arrangement of those elements is not the same as the arrangement of the allegedly corresponding elements in Applicant's claims. There is simply no basis for the rejections remaining against the claims on appeal.

### **THE CITED REFERENCES**

#### **A. United States Patent No. 5,777,418 ("the *Lange* reference")**

The *Lange* reference discloses a transverse flux motor. The figures relied upon by the Examiner show what the *Lange* reference considers to be a prior art motor arrangement. Figures 1A and 1B are described, in relevant part, in the *Lange* reference as follows:

With respect to FIGS. 1a and 1b, a longitudinal section to a transverse flux motor is shown, in which, in a housing, a rotor 1 is disposed and rotatably mounted, with a rotor shaft 2 and a drive flange. In a central part of the motor shown in FIGS. 1a

and 1b, the rotor shaft has a collar on which a circular central carrier disk 3 is secured. At the radial outside periphery of this carrier disk 3, ring-shaped or drum-shaped pole body structures extend on both sides in the axial direction, designated here as 4a and 4b. These pole body structures 4a and 4b each comprise permanent magnets 5 disposed in two rows and polarized alternately in a peripheral direction. For the pole body structure 4a there are magnets 5a and for the pole body structure 4b, there are magnets 5b. The pole body structures 4a and 4b also have soft iron elements. In FIGS. 1a and 1b, the soft iron elements are designated 6a1 and 6a2 for the pole body structure 4a and designed 6b1 and 6b2 for the pole body structure 4b (but this is not shown). In the axial direction, each pole body structure 4a and 4b is built as follows: starting from the carrier disk 3 there is disposed a first row of extending permanent magnets 5 or soft iron elements 6, followed by an intermediate ring 7, followed by a second row of permanent magnets 5 or soft iron elements 6, then followed by an end ring 8.

An inner stator 13b and an outer stator 13a are provided radially within and outside the pole body structures 4a and 4b. Each of stators 13a and 13b comprise a plurality of stator soft iron elements 10 on the stator housing assigned to the pole body structures and disposed in a peripheral direction.

(Column 3, line 55-column 4, line 16).

Notwithstanding these express teachings, the Examiner interprets the *Lange* reference as follows:

Lange illustrates in Fig. 1 a motor having a stator with first and second stator core portions (6 and 7), in which a coil (winding) (8) is situated between the core portions (6 and 7) with at least part of an axial surface of the coil (winding) (8) is covered by the core portions (6 and 7). The stator core portions (6 and 7) are of a generally annular ring that have a plurality of circumferentially spaced projections that project radially inward from the ring. Additionally, a rotor (2) having a core (12) and a plurality of magnets (13). In which the stator and a rotor are supported in a relative rotary motion, and that the plurality of magnets (13) of the rotor (2) interact with the stator core portions (6 and 7) during relative rotor motion.

(Final Rejection, page 3).

The differences between the express teachings of the *Lange* reference and the Examiner's interpretation are readily apparent and need not be described in lengthy detail. It is perhaps most noteworthy that the Examiner's interpretation of the end ring 8 (even assuming that element could

be interpreted as a coil of some sort) does not satisfy the Examiner's own statements because the end ring 8 is not covered by the soft iron elements 6 or the intermediate ring 7.

**B. United States Patent No. 5,051,641 ("the *Weh* reference")**

The Examiner relies upon Figure 4 of the *Weh* reference as showing magnetic stator core portions E1a and E1b partially enclosed on outward axial surfaces by two support structures ZGa and ZGb. The only description of the intermediate casings ZG is found in column 5, lines 15-21 of the *Weh* reference. "Through the symmetrical arrangement of the stators in respect to the rotor R given in Fig. 4,...there is also achieved a form favorable for the assembling. The smallest unit, a string-half, is connected with the aid of an intermediate casing ZG with the appertaining casing shell G."

The Examiner contends as discussed below that the casings ZG of *Weh* would provide "magnetization toward the axis of movement," and that it would have been obvious to add those casings to the structure of the *Lange* reference "in order to provide the axis of movement by way of magnetization."

**C. United States Patent No. 5,117,142 ("the *vonZweybergk* reference")**

The Examiner cites the *vonZweybergk* reference for showing stator portions made from laminated steel sheets.

**THE REJECTION UNDER 35 U.S.C. §102(b) IS IMPROPER**

The *Lange* reference does not show what the Examiner contends. The Examiner is misreading elements in the *Lange* reference. The soft iron elements 6 and the intermediate rings 7 of the *Lange* reference are not stator portions. Moreover, the end ring 8 is not a coil nestingly

received between stator portions. In fact, the end ring 8 is not even received between the portions 6 and 7 of the *Lange* reference.

There simply is no way to read Applicant's claims on the *Lange* reference as contended by the Examiner. Even if the end ring 8 could be construed as a coil, it is axially outside of the elements 6.

### **CLAIMS 10 AND 16 ARE ALLOWABLE**

Claim 10, recites, in part, "first and second stator core portions and a coil nestingly supported between the core portions such that at least part of axial surfaces on the coil are covered by the core portions." There is nothing like this in the *Lange* reference and there is no anticipation. Claim 16, which depends from claim 10, is not anticipated, either.

### **THE REJECTIONS UNDER 35 U.S.C. §103 ARE IMPROPER**

- 1. The Proposed Combination of the *Lange* and *Weh* references does not establish a *prima facie* case of obviousness against Claims 11 and 12.**

The Examiner is rejecting claims 11 and 12 based on the combination of *Lange* and *Weh* contending that the casings ZG of the *Weh* reference would provide magnetization toward the axis of movement if they were combined with the teachings of the *Lange* reference. The combination cannot be made because there is no benefit to the proposed modification to the *Lange* reference. To begin with, it is completely unclear how the casings CG of the *Weh* reference would fit into the arrangement of the *Lange* reference. Even if they were somehow accommodated in that arrangement, there is no teaching of how they would cooperate with the elements 6 and 7 or how they would provide any benefit. The body structures 4a and 4b of the *Lange* reference completely

serve their intended purpose and cooperate with the carrier disk 3 in a manner that makes it difficult to imagine how the casings ZG of the *Weh* reference would provide any benefit. The only possible justification for the proposed combination, which cannot be made, is hindsight reasoning.

Additionally, even if the combination could be made, the result is not the same as the claimed invention. As pointed out above, the elements of *Lange* do not correspond to what is recited in Applicant's claims. Adding the casings from the *Weh* reference would not rearrange *Lange's* components in any way to make them the same as what is claimed. Therefore, even if the combination were proper, it is not the same as the claimed invention and the claims cannot be considered obvious.

#### **CLAIMS 11 AND 12 ARE ALLOWABLE**

As noted above, there is no *prima facie* case of obviousness because there is no motivation for making the combination where there is no benefit for doing so. Further, even if the combination were proper, it is not the same as the claimed arrangement.

#### **2. Claims 14 and 21 cannot be considered obvious over the *Lange* reference.**

The Examiner contends that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a suitable material for the stator core portions, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice." Even if the Examiner were right, the result is not the same as the claimed invention because of the differences between the *Lange* reference and the claimed arrangement as pointed out above. There is nothing within *Lange*, even if it were modified as a matter of design choice, that would provide sintered powder stator portions that nestingly receive a coil as required by claim 14. The end ring 81 is not



nestingly received by the iron elements 6 and the intermediate ring 7, regardless of what they are made from. Similarly, there is nothing within the *Lange* reference that would suggest using a prewound coil as required by claim 21. Moreover, there would be no benefit to modifying *Lange* in the proposed manner.

None of the claims can be considered obvious over the *Lange* reference and any proposed modification to the distorted interpretation of that reference proposed by the Examiner is not based upon proper legal motivation, in part because there would be no benefit for such a modification.

### **CLAIMS 14 AND 21 ARE ALLOWABLE**

There is no *prima facie* case against claims 14 and 21 because even the Examiner's proposed modification to the *Lange* reference, for which there is no motivation, is not the same as the claimed invention.

#### **3. Claim 15 cannot be considered obvious over the proposed combination of *Lange* and *vonZweybergk*.**

The Examiner proposes to make the improper combination of *Lange* and *vonZweybergk*. The combination cannot be made, in part, because the soft iron elements 6 of the *Lange* reference would cease to exist as required by the teachings of that reference if they were replaced with a laminated sheet metal ring as taught by *vonZweybergk*. The soft iron elements 6 of the *Lange* reference cannot be made with laminated steel sheets. If one were to substitute laminated steel sheets, the soft iron elements 6 would no longer function as soft iron elements. Accordingly, the proposed modification to the *Lange* reference defeats the intended operation of the teachings of that reference and, therefore, there is no motivation for making the proposed combination.

Further, even if the combination were proper, it is not the same as the claimed arrangement for the reasons already discussed above. There is simply no *prima facie* case of obviousness against claim 15.

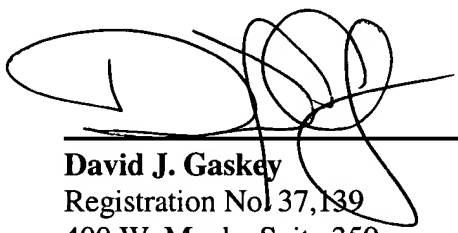
### **CONCLUSION**

All claims are allowable. The Examiner cannot interpret the *Lange* reference as proposed in an attempt to read Applicant's claims on that reference. There is no anticipation. There is no legal motivation for making any of the proposed modifications or combinations and, therefore, there is not a *prima facie* against any of the claims rejected under 35 U.S.C. §103. This case is in condition for allowance. All rejections must be reversed.

**Respectfully solicited,**

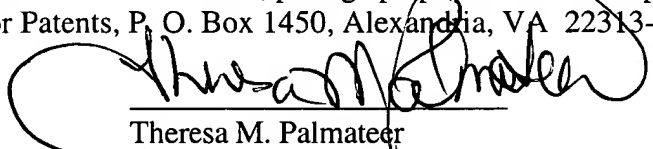
**CARLSON, GASKEY & OLDS, P.C.**

November 7, 2003  
Date

  
\_\_\_\_\_  
David J. Gaskey  
Registration No. 37,139  
400 W. Maple, Suite 350  
Birmingham, MI 48009  
(248) 988-8360

### **CERTIFICATE OF MAIL**

I hereby certify that the enclosed **Appeal Brief (in triplicate)** and **Fees** is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Mail Stop AF, Commissioner For Patents, P. O. Box 1450, Alexandria, VA 22313-1450 on 11-7-03.

  
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Theresa M. Palmateer

**APPENDIX OF CLAIMS**

10. A motor assembly comprising:

a stator having first and second stator core portions and a coil nestingly supported between the core portions such that at least part of axial surfaces on the coil are covered by the core portions;

a rotor having a core and a plurality of magnets, the stator and rotor being supported to allow for relative rotary motion between the rotor and the stator such that the plurality of magnets of the rotor interact with the stator core portions during such relative rotary motion.

11. The assembly of claim 10, including two support members that enclose at least part of outward axial surfaces of the core portions.

12. The assembly of claim 11, including a plurality of magnetic core members supported by the support members.

14. The assembly of claim 10, wherein each stator core portion comprises sintered powder material.

15. The assembly of claim 10, wherein each stator core portion comprises a laminated ring.

16. The assembly of claim 10, wherein each stator core portion includes a generally annular ring and a plurality of circumferentially spaced projections that project radially inward from the ring.

21. The assembly of claim 10, wherein the stator coil comprises a rewound coil that is inserted between the stator core portions.

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## **Argument**

### **INTRODUCTION**

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### **THE CITED REFERENCES**

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and 1b, the rotor shaft has a collar on which a circular central carrier disk 3 is secured. At the radial outside periphery of this carrier disk 3, ring-shaped or drum-shaped pole body structures extend on both sides in the axial direction, designated here as 4a and 4b. These pole body structures 4a and 4b each comprise permanent magnets 5 disposed in two rows and polarized alternately in a peripheral direction. For the pole body structure 4a there are magnets 5a and for the pole body structure 4b, there are magnets 5b. The pole body structures 4a and 4b also have soft iron elements. In FIGS. 1a and 1b, the soft iron elements are designated 6a1 and 6a2 for the pole body structure 4a and designed 6b1 and 6b2 for the pole body structure 4b (but this is not shown). In the axial direction, each pole body structure 4a and 4b is built as follows: starting from the carrier disk 3 there is disposed a first row of extending permanent magnets 5 or soft iron elements 6, followed by an intermediate ring 7, followed by a second row of permanent magnets 5 or soft iron elements 6, then followed by an end ring 8.

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(Column 3, line 55-column 4, line 16).

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The Examiner relies upon Figure 4 of the *Weh* reference as showing magnetic stator core portions E1a and E1b partially enclosed on outward axial surfaces by two support structures ZGa and ZGb. The only description of the intermediate casings ZG is found in column 5, lines 15-21 of the *Weh* reference. "Through the symmetrical arrangement of the stators in respect to the rotor R given in Fig. 4,...there is also achieved a form favorable for the assembling. The smallest unit, a string-half, is connected with the aid of an intermediate casing ZG with the appertaining casing shell G."

The Examiner contends as discussed below that the casings ZG of *Weh* would provide "magnetization toward the axis of movement," and that it would have been obvious to add those casings to the structure of the *Lange* reference "in order to provide the axis of movement by way of magnetization."

**C. United States Patent No. 5,117,142 ("the *vonZweybergk* reference")**

The Examiner cites the *vonZweybergk* reference for showing stator portions made from laminated steel sheets.

**THE REJECTION UNDER 35 U.S.C. §102(b) IS IMPROPER**

The *Lange* reference does not show what the Examiner contends. The Examiner is misreading elements in the *Lange* reference. The soft iron elements 6 and the intermediate rings 7 of the *Lange* reference are not stator portions. Moreover, the end ring 8 is not a coil nestingly

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There simply is no way to read Applicant's claims on the *Lange* reference as contended by the Examiner. Even if the end ring 8 could be construed as a coil, it is axially outside of the elements 6.

**CLAIMS 10 AND 16 ARE ALLOWABLE**

Claim 10, recites, in part, "first and second stator core portions and a coil nestingly supported between the core portions such that at least part of axial surfaces on the coil are covered by the core portions." There is nothing like this in the *Lange* reference and there is no anticipation. Claim 16, which depends from claim 10, is not anticipated, either.

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1. **The Proposed Combination of the *Lange* and *Weh* references does not establish a *prima facie* case of obviousness against Claims 11 and 12.**

The Examiner is rejecting claims 11 and 12 based on the combination of *Lange* and *Weh* contending that the casings ZG of the *Weh* reference would provide magnetization toward the axis of movement if they were combined with the teachings of the *Lange* reference. The combination cannot be made because there is no benefit to the proposed modification to the *Lange* reference. To begin with, it is completely unclear how the casings CG of the *Weh* reference would fit into the arrangement of the *Lange* reference. Even if they were somehow accommodated in that arrangement, there is no teaching of how they would cooperate with the elements 6 and 7 or how they would provide any benefit. The body structures 4a and 4b of the *Lange* reference completely

serve their intended purpose and cooperate with the carrier disk 3 in a manner that makes it difficult to imagine how the casings ZG of the *Weh* reference would provide any benefit. The only possible justification for the proposed combination, which cannot be made, is hindsight reasoning.

Additionally, even if the combination could be made, the result is not the same as the claimed invention. As pointed out above, the elements of *Lange* do not correspond to what is recited in Applicant's claims. Adding the casings from the *Weh* reference would not rearrange *Lange's* components in any way to make them the same as what is claimed. Therefore, even if the combination were proper, it is not the same as the claimed invention and the claims cannot be considered obvious.

### **CLAIMS 11 AND 12 ARE ALLOWABLE**

As noted above, there is no *prima facie* case of obviousness because there is no motivation for making the combination where there is no benefit for doing so. Further, even if the combination were proper, it is not the same as the claimed arrangement.

#### **2. Claims 14 and 21 cannot be considered obvious over the *Lange* reference.**

The Examiner contends that "it would have been obvious to one having ordinary skill in the art at the time the invention was made to choose a suitable material for the stator core portions, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice." Even if the Examiner were right, the result is not the same as the claimed invention because of the differences between the *Lange* reference and the claimed arrangement as pointed out above. There is nothing within *Lange*, even if it were modified as a matter of design choice, that would provide sintered powder stator portions that nestingly receive a coil as required by claim 14. The end ring 81 is not

nestingly received by the iron elements 6 and the intermediate ring 7, regardless of what they are made from. Similarly, there is nothing within the *Lange* reference that would suggest using a prewound coil as required by claim 21. Moreover, there would be no benefit to modifying *Lange* in the proposed manner.

None of the claims can be considered obvious over the *Lange* reference and any proposed modification to the distorted interpretation of that reference proposed by the Examiner is not based upon proper legal motivation, in part because there would be no benefit for such a modification.

#### **CLAIMS 14 AND 21 ARE ALLOWABLE**

There is no *prima facie* case against claims 14 and 21 because even the Examiner's proposed modification to the *Lange* reference, for which there is no motivation, is not the same as the claimed invention.

**3. Claim 15 cannot be considered obvious over the proposed combination of *Lange* and *vonZweybergk*.**

The Examiner proposes to make the improper combination of *Lange* and *vonZweybergk*. The combination cannot be made, in part, because the soft iron elements 6 of the *Lange* reference would cease to exist as required by the teachings of that reference if they were replaced with a laminated sheet metal ring as taught by *vonZweybergk*. The soft iron elements 6 of the *Lange* reference cannot be made with laminated steel sheets. If one were to substitute laminated steel sheets, the soft iron elements 6 would no longer function as soft iron elements. Accordingly, the proposed modification to the *Lange* reference defeats the intended operation of the teachings of that reference and, therefore, there is no motivation for making the proposed combination.

Further, even if the combination were proper, it is not the same as the claimed arrangement for the reasons already discussed above. There is simply no *prima facie* case of obviousness against claim 15.

### **CONCLUSION**

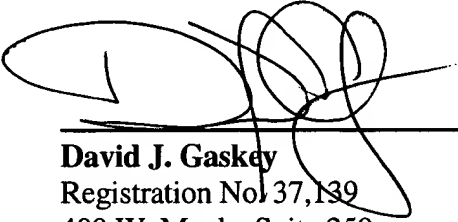
All claims are allowable. The Examiner cannot interpret the *Lange* reference as proposed in an attempt to read Applicant's claims on that reference. There is no anticipation. There is no legal motivation for making any of the proposed modifications or combinations and, therefore, there is not a *prima facie* against any of the claims rejected under 35 U.S.C. §103. This case is in condition for allowance. All rejections must be reversed.

Respectfully solicited,

CARLSON, GASKEY & OLDS, P.C.

November 7, 2003

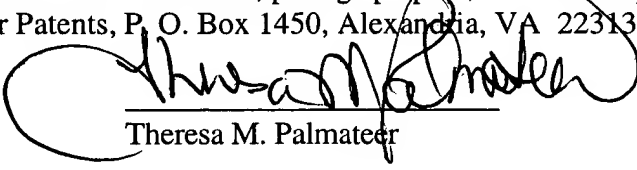
Date



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### **CERTIFICATE OF MAIL**

I hereby certify that the enclosed **Appeal Brief (in triplicate) and Fees** is being deposited with the United States Postal Service as First Class Mail, postage prepaid, in an envelope addressed to Mail Stop AF, Commissioner For Patents, P. O. Box 1450, Alexandria, VA 22313-1450 on 11-7-03.



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Theresa M. Palmateer

### **APPENDIX OF CLAIMS**

10. A motor assembly comprising:

a stator having first and second stator core portions and a coil nestingly supported between the core portions such that at least part of axial surfaces on the coil are covered by the core portions;

a rotor having a core and a plurality of magnets, the stator and rotor being supported to allow for relative rotary motion between the rotor and the stator such that the plurality of magnets of the rotor interact with the stator core portions during such relative rotary motion.

11. The assembly of claim 10, including two support members that enclose at least part of outward axial surfaces of the core portions.

12. The assembly of claim 11, including a plurality of magnetic core members supported by the support members.

14. The assembly of claim 10, wherein each stator core portion comprises sintered powder material.

15. The assembly of claim 10, wherein each stator core portion comprises a laminated ring.

16. The assembly of claim 10, wherein each stator core portion includes a generally annular ring and a plurality of circumferentially spaced projections that project radially inward from the ring.

21. The assembly of claim 10, wherein the stator coil comprises a prewound coil that is inserted between the stator core portions.

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